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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/559,870	12/07/2005	Taketo Takeuchi	125195	7536

25944 7590 01/25/2011

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ART UNIT	PAPER NUMBER
2837	

NOTIFICATION DATE	DELIVERY MODE
01/25/2011	ELECTRONIC

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RECORD OF ORAL HEARING

UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex Parte TAKETO TAKEUCHI

Appeal 2010-000888
Application 10/559,870
Technology Center 2800

Oral Hearing Held: October 12, 2010

Before ROBERT E. NAPPI, JOSEPH F. RUGGIERO, and ELENI MANTIS MERCADER, *Administrative Patent Judges.*

APPEARANCES:

ON BEHALF OF THE APPELLANT:

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The above-entitled matter came on for hearing on Tuesday, October 12, 2010, commencing at 10:03 a.m., at the U.S. Patent and Trademark Office, 600 Dulany Street, Alexandria, Virginia, before Victor Lindsay, a Notary Public.

THE USHER: Calendar No. 9, Appeal No. 2010-000888, Mr. Schulte.

JUDGE NAPPI: Good morning, Mr. Schulte.

MR. SCHULTE: Morning, Your Honor.

JUDGE NAPPI: Can I ask that you give the stenographer a copy of your business card so we get the spelling of your name for the record?

MR. SCHULTE: Sure.

COURT REPORTER: Thank you very much.

JUDGE NAPPI: I see you have visual aids.

MR. SCHULTE: Yes.

JUDGE NAPPI: My standard question is have you [sic] all been presented to the Examiner?

MR. SCHULTE: Yes.

JUDGE NAPPI: Okay.

MR. SCHULTE: These are just drawings. All I did was -- and I'll show you in a second -- was copy the last two paragraphs of Claims 1 and 9, illustrate the top graph of our Figure 7, and then illustrate the prior art's Figure 2B.

JUDGE NAPPI: Okay.

MR. SCHULTE: I think the only thing I did really is, on our Figure 7, just color just to make it easier to view. Actually, the two pieces of prior art

I'm going to be talking about, the first one -- one of them is Matsunaga, and the other one I'll give you a spelling in a second. The second reference I'll be discussing is Shimazaki, which is S-h-i-m-a-z-a-k-i.

All right. Ready to begin?

JUDGE NAPPI: Yeah.

MR. SCHULTE: Good morning, Your Honor. My name is Scott Schulte with Oliff and Berridge. I'm here to represent Aisin AW in this appeal. What our application is directed to is a vehicle motor. More specific to that is controlling the torque of a vehicle motor, and more specific to that is controlling the torque of a vehicle motor when the vehicle is stalled.

Before getting into the single 103 rejection over Matsunaga and Shimazaki, just to briefly explain the claims, I want to produce -- in this bottom chart, in the last two paragraphs of Claims 1 and 9 -- sorry about that --

JUDGE NAPPI: It's okay. If it's 1 and 9, we have them in front of us on the --

MR. SCHULTE: Last two paragraphs of Claims 1 and 9. And specifically, the features that are highlighted is the fact that the torque of our vehicle motor is reduced when a stalled state of the vehicle is detected and when a selected temperature exceeds a restrictive temperature. I'll be emphasizing the temperature aspect. And a second feature is the fact that this selected temperature is from a coil where a maximum current flow is detected.

Now, what does that mean specifically? According to our invention -- like I say, we got a vehicle motor. A vehicle motor, when it rotates, goes between the U, V and W phases. When you're in a stalled state, you don't want to be stuck in a certain coil because, if you do, you're going to overheat that coil and damage your motor.

So what we're doing in our invention is we're comparing temperatures, a selected temperature to a restrictive temperature. So for example, in this example, let's say, when you're stalled, you're stuck on the U phase, we are going to monitor the temperature, i.e. the selected temperature of the U phase coil, because it's the coil where the maximum current is detected. And we're going to monitor the temperature until it reaches this predetermined restrictive temperature. Once it does that, then, according to our claim, we are going to reduce the torque because you're in a stalled state. And that's like the temperature exceeds a restrictive temperature just going -- like I said, will reduce torque, vehicle moves backwards, goes to the next coil, which in this case would be the W phase, again, at time T-2 goes into a stalled state, and now we're going to monitor this selected temperature because it's a temperature where the max -- it's the coil where the maximum current flow is detected.

And if I keep doing that, we want to achieve two things. One, by maintaining at a coil, we believe we can actually achieve a higher torque when we're in a stalled state. And secondly, we're going to actually reduce it when it hits a certain temperature because, again, you want to avoid burning that specific coil. So again, with our claims, again, we're monitoring temperature.

Now, we think the Examiner's rejection -- the prior art is wrong for two reasons. The first reason is the fact that we do not believe that Matsunaga discloses comparing temperature, a selected temperature exceeding a restrictive temperature. We also think the Examiner is wrong with the secondary feature saying that the selected temperature is from a coil where a maximum current flow is detected. The Examiner is relying on Shimazaki for this feature and has admitted that Matsunaga fails to disclose the feature cited in this last paragraph.

Now, going to the first feature as to why we believe that Matsunaga fails to compare temperatures, because if you look at Matsunaga, again, they want to -- the goal they're mentioning is to avoid overheating -- I've added this part here -- is to avoid overheating, and that could be found at the end of the flow chart and description.

Now, on their flow chart, at this step a stalled state has already been detected. But what they're going to do in order to reduce torque, two conditions for them have to be met, that the restrictive torque has to be less than the torque demand, torque demand being based on how much you pressed on the accelerator and whether or not the phase domain is the same -- again, they're not comparing the temperatures. They're simply --

JUDGE NAPPI: Well, isn't the temperature up in the prior steps, in 25 and 26?

MR. SCHULTE: Yes, Your Honor --

JUDGE NAPPI: I'm sorry, 25 and 27?

MR. SCHULTE: Correct. What they're doing is they're estimating the hottest temperature, and I don't have this figure in front of me, but in

other figures they're using that to actually determine the restrictive torque, and that restrictive torque goes down as the temperature goes up, but they're not -- that's all the temperature is being used for. They're not comparing a temperature to another temperature or, for our case, a restrictive temperature. They're saying if it's less than this torque demand, which, again, has nothing to do with the temperature, which is more just based on how much the driver is accelerating or pressing down on the accelerator, as well as other factors, none of which are related to the temperature. So again, he's comparing torques, and then, obviously, in this step, he's seeing if the phase domain is the same.

So again, in a very simple way, he does not compare temperature and therefore fails -- we believe that he fails to disclose the features. And in this paragraph, in the second to last paragraph of Claims 1 and 9 --

JUDGE MANTIS MERCADER: Counselor, in Figure 3 of Matsunaga, it shows that the temperature -- at 140 degrees Celsius the torque is starting to decrease when that happens. Isn't that equivalent to what you're doing on Figure 5 of your invention? You detect the restrictive temperature and then the torque goes down, you're reducing the torque?

MR. SCHULTE: I'd have to re-review our figure, but torque should go down as the temperature goes up.

JUDGE MANTIS MERCADER: What I'm saying is, as I'm reading your limitations, is that they're detecting a restrictive temperature and then the torque goes down?

MR. SCHULTE: I don't think so, Your Honor, because I know if you look at our description, our discussion of our Figure 7 is we're actually

looking at temperature as a step. And I'd have to revisit our Figure 5 -- and I do believe it's different because, again, we're specifically looking at temperature. They're looking at torque. The only comparison they have with restrictive torque, the only comparison they're making is to this torque demand.

JUDGE MANTIS MERCADER: Do you have Figure 3 in front of you? Can you take a look at it, please?

MR. SCHULTE: I have the --

JUDGE MANTIS MERCADER: Or you can come -- you can step over here, and I'll show you.

MR. SCHULTE: Okay.

JUDGE MANTIS MERCADER: That will be probably the fastest way.

MR. SCHULTE: Right.

JUDGE MANTIS MERCADER: If you look at Matsunaga, Figure 3, you see there is a restrictive torque --

MR. SCHULTE: Correct. The restrictive torque goes down as the temperature goes up, or the estimated temperature goes up.

JUDGE MANTIS MERCADER: Right. So isn't that inherent that when the temperature reaches 140, that will be the restrictive temperature and the torque will go down? That's included in Steps S-25 and S-27.

MR. SCHULTE: I don't see -- the reason -- I'm trying to make a comparison on what are they comparing it to. Obviously, the restrictive torque goes down as -- their restrictive torque goes down as the temperature goes up. But I'm still thinking about what are they comparing it to as far as a

predetermined temperature, because the problem with the prior art is if their torque demand is less than their restrictive torque, they're not going to switch, irregardless of the temperature.

JUDGE NAPPI: But once the torque command is above, equal to or above the restrictive torque --

MR. SCHULTE: Then they're going to --

JUDGE NAPPI: At Step 29 there, it basically becomes a straight line. So why aren't you comparing --

MR. SCHULTE: Right. Their phase domain --

JUDGE NAPPI: -- temperature at that point in time?

MR. SCHULTE: Your Honor, I don't see that temperature is being compared to -- because -- and the reason why I don't believe they disclose this is because TC really has nothing to do with temperature. It's just a torque demand based on how much a vehicle is operating. So although this value goes down as the temperature goes up, there is -- that's why we don't believe that they -- and because this value has nothing to do with temperature, we don't believe they're comparing temperatures -- just seeing if the selected temperature -- restrictive torque. And again, if this condition has to be satisfied for them to move -- torques, selective torque, has to be satisfied for it to go down.

And we believe there is a benefit to using our invention versus the prior art. We believe that they know that there's an overheated state that's out there. Well, we believe they are prematurely switching torque. This could be -- the temperature could be high. And like I said, if the TC is higher, then obviously it's going to switch. But then again, TR, the

temperature, could be very low. It could be on the left-hand side. And if TC is high enough, they're going to switch. So the temperature could be high, it could be low, but if this condition is satisfied, they're going to switch.

JUDGE NAPPI: No. Because this goes back to what my colleague was saying with Figure 5. If the temperature is below, there is no adjustment. It's not until it's after 140 that there's adjustment down.

MR. SCHULTE: But you're -- but to do that, you're assuming that TC is less than TR.

JUDGE NAPPI: But if TC and TR are the same, that's Step 27 of calculating the limitation.

MR. SCHULTE: All right. It won't -- the answer will be no --

JUDGE NAPPI: It'll adjust -- yeah. You'll always go straight through Step 29. So 27, which is the step of calculating the torque T sub T from TJ max --

MR. SCHULTE: T of R of TJ max --

JUDGE NAPPI: Yeah.

MR. SCHULTE: But Your Honor, if -- let's take -- let's say it's cool. Let's say it's on the left-hand side of Figure --

JUDGE NAPPI: 5.

MR. SCHULTE: Figure 5, thank you -- of Figure 5. If TC is greater than, or TC is greater than --

JUDGE NAPPI: I'm sorry, Figure 3. Just -- I'm sorry --

MR. SCHULTE: I'm sorry, Figure 3 --

JUDGE NAPPI: So it's right on the record.

MR. SCHULTE: But like I said, even if you look on the left-hand side of Figure 3, if TR -- I'm sorry, if TC is greater than, or another way of saying it, TR is less than TC, if this is cold or if it's hot, it's going to switch the domain, and that's why we don't believe that they select temperatures, because again, for the reasons you mentioned, you're right. If this keeps going down and this torque is higher than that, then -- or if TR is less, then it'll switch, but -- and likewise, if TR is on the left-hand side of Figure 3 and you have a relatively high TR, for example, if TC is greater than, or another way of saying it, TR is less than, it's going to switch through.

Now, whether or not you're going to have a TC that's greater than a TR in Figure -- when that's going to occur, that's really a guess. I don't think that's discussed in the prior art. I mean, the prior art just talks about determining TR based on the junction temperature. But again -- and this is just coming from the grab -- TC, which has nothing -- is greater than, irregardless of TR and irregardless of temperature, it's going to switch.

And then so we sort of guess as to what TC, whether it will or will not be greater than, but that's not in the prior art, because what the Examiner -- and this is what we disagree with -- the point we argue with the Examiner is I think he's trying to extrapolate from the term overheated state, the concept that because there's an overheated state, we believe that there is a temperature we want to avoid and because there's a temperature we want to avoid, we're somehow comparing temperatures. And that's in the Examiner's Answer.

And like I said, we disagree with it for several reasons. One of the reasons is because we don't think that interpretation is supported by the prior

art. We think it's really based -- technically, we really think it's based on hindsight. Another reason that she could have extrapolated the meaning of overheated state is by, again, looking at our specification and claims. And two, I think it ignores how it actually works. Again, phase domain we have a focus on, and the other condition being these torques. And again, just to emphasize, this has nothing to do with temperature, and if this is greater than TR, irregardless of the temperature, it's going to --

JUDGE NAPPI: It's going to limit the torque to TR, the restrictive torque.

MR. SCHULTE: Well, TC is not based --

JUDGE NAPPI: TC is a commanded torque. TR is a restrictive torque.

MR. SCHULTE: Right.

JUDGE NAPPI: So when TC -- when you try to demand more from the motor than it's going to give, you get the restrictive torque.

MR. SCHULTE: I don't think -- I think if you want more from the -- more torque from the motor than it's able to give, and that can change based on if it's going to restrict, if TC -- and I'm just going to throw out the numbers initially -- if TC is 10, for example, and on the left-hand side of that chart, if it's a low temperature, TR is -- restrictive torque is 9, and then when it's a hotter temperature TR goes down to 4, well, in both scenarios, TC is 10. That's both scenarios TC is greater than TR. And it's going to, if the phase domain switch is the same, it's going to reduce torque. And that's what I mean, that if the torque demand -- if you want more than the motor, as long as that condition is met, then it's going to reduce.

JUDGE NAPPI: Yes, but when you put the Figure 3 in, which corresponds to Step 27, it's going to reduce -- what Figure 3 shows is that TR is flat. It's a fixed value --

MR. SCHULTE: To a certain point --

JUDGE NAPPI: -- up until a certain temperature. And then beyond that temperature, it starts reducing it.

MR. SCHULTE: Correct.

JUDGE NAPPI: Okay. So that equation that we just talked about, where TC is greater than TR, is going to be one thing above the temperature -- I'm sorry, it's going to be flat below the temperature, and once you get above 140, it's going to reduce. And I guess the question becomes why doesn't that meet your claim where it says wherein the torque in the motor vehicle is reduced when a selected temperature exceeds the restrictive temperature?

MR. SCHULTE: Well, I think the one thing that I think you're assuming is that TC is constant. It's not discussed in the prior art, but I can't imagine during the course of driving a vehicle TC is maintaining constant.

JUDGE NAPPI: But we only need one mode of operation that meets your claim and anticipates, or in this case, to make obvious your claim.

MR. SCHULTE: But if TC --

JUDGE NAPPI: The fact that he puts Step 29 in means he anticipates at some point in time TC might be greater than TR.

MR. SCHULTE: Right. Correct. And then when is TC greater than -- I'm sorry, when is --

JUDGE NAPPI: When TC is --

MR. SCHULTE: -- TC is greater than TR and when is it less than TR?

JUDGE NAPPI: But when it's greater than TR, then the question becomes why doesn't that meet your claim? Maybe it's not on this feature. I don't know. That's fine.

MR. SCHULTE: I still don't believe that, and the reason I don't believe is because this has really nothing to do with temperature, that they're not comparing temperatures, and that --

JUDGE NAPPI: No. The Step 27 is the step which is comparing temperatures.

JUDGE MANTIS MERCADER: Right. TR --

MR. SCHULTE: But you're calculating TR --

JUDGE NAPPI: I know, but if --

JUDGE MANTIS MERCADER: Right.

JUDGE NAPPI: The calculation of TR is showing that it's flat below a certain temperature and then diminishes after that temperature.

MR. SCHULTE: See --

JUDGE NAPPI: And you're not -- actually, in Claim 1 I'm looking at right now, you're not saying you're comparing. You're saying the torque is reduced when a temperature exceeds a restrictive temperature?

MR. SCHULTE: Correct.

JUDGE NAPPI: And that describes Figure 3. It's flat, and then above a restrictive temperature, it's reduced. So our question is, is why doesn't that meet the claim?

MR. SCHULTE: Because they are not determining whether or not a selected temperature exceeds a restrictive temperature. You can consider the temperature in Figure 3 as being a restrictive temperature. But they're reducing torque -- I mean they're reducing TR.

JUDGE NAPPI: They're reducing TR, which does relate to the torque of the vehicle.

MR. SCHULTE: But they're not -- doesn't seem like they're looking to see if that restrictive [sic] temperature exceeds a restrictive temperature, or if that -- if the selected temperature exceeds a restrictive temperature. I'm assuming you're taking from the chart that TR is a restrictive temperature? I --

JUDGE NAPPI: TJ max. TR is torque.

MR. SCHULTE: TJ -- TR -- so you're considering TJ to be the selected temperature?

JUDGE NAPPI: Is that what the Examiner did? That's my understanding --

MR. SCHULTE: The Examiner didn't take any of this. I mean he just --

JUDGE NAPPI: Oh --

JUDGE MANTIS MERCADER: The Examiner just --

MR. SCHULTE: -- I think extrapolated from overheated state the fact that you're comparing temperatures.

JUDGE NAPPI: Okay.

MR. SCHULTE: Again, I think on the -- of what is selected temperature and what is restrictive temperature.

JUDGE MANTIS MERCADER: But TR is the torque at the restrictive temperature, so --

MR. SCHULTE: Okay. So if you take -- so what would be the selected temperature?

JUDGE MANTIS MERCADER: So the restrictive temperature would be 140 degrees Celsius. That's when it starts going down.

MR. SCHULTE: Okay. And the selected temperature would be?

JUDGE MANTIS MERCADER: 140.

JUDGE NAPPI: No. The selected is the one you're comparing to 140.

JUDGE MANTIS MERCADER: Oh. It would be like whatever -- if it exceeds 140, then the torque would be going down -- whatever that temperature is.

JUDGE NAPPI: Which I guess is the temperature S-23?

MR. SCHULTE: But if you take the -- well, I think with Figure 3, isn't that you're monitoring a temperature? Basically, you're calculating a temperature, estimating a temperature. You're taking that temperature and comparing it to that Figure 3 to get a restrictive torque. So you're never looking at a value above that temperature in Figure 3. It's just chart of what's the temperature and then the torque goes down. But I don't know if it goes -- if the next time you cycle through the flow chart, if the temperature goes higher, you're really going across -- you get your findings in the next -- what the TR would be with that new temperature. That's why I'm not sure what you consider to be a selected temperature.

JUDGE NAPPI: Well, does the Examiner rely on -- and I can't pronounce that second reference --

MR. SCHULTE: The Examiners rely on the second reference for the concept that the maximum, or the highest, temperature would come from the coil with -- the coil with the maximum current is the coil with the maximum temperature, and we disagree with that reason. And Matsunaga fails to disclose this feature and -- drawing on the fact that Shimazaki discloses maximum -- coil with the maximum temperature is the coil with the maximum current, and we disagree. I think the easiest way to explain that, why we disagree, is if you look at this time immediately after Time 2, the current has been taken away from the U phase. However, the U phase has a higher temperature. And at this point, the W phase has a maximum current because that's where the maximum current is flowing through.

So again, we all think that it's not necessarily true that a maximum -- the coil with the maximum temperature is the coil with the maximum current because you're probably going to have to worry about this is the total maximum current and this the coil with the maximum current. And again, I guess the easiest one is the analogy with the light bulb. If you have a light bulb on all day and you turn it off and turn on another one, well, that light bulb is still hotter than the one that you just turned on. So again, we don't think that's wrong. And again, we don't also know -- the reason is that we don't think the prior art discloses that.

So I guess to summarize, we still think he's wrong about taking -- about comparing a selected temperature to a restrictive temperature because, again, it doesn't mention comparing temperatures, he's mentioned comparing

torques, and that this value right here is not related to temperature. And therefore, just take them from the chart, and we don't believe he's comparing temperatures. He sets up torque based on temperature, but he's not comparing temperatures. That's all I have.

JUDGE NAPPI: Okay. Any questions? Eleni?

JUDGE MANTIS MERCADER: No.

JUDGE NAPPI: Okay.

Whereupon, the proceedings, at 10:26 a.m., were concluded.